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EXAMINER

MICALI, JOSEPH

ART UNIT

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1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/567,177 | Applicant(s) THORSTEINSON, ERLIND M. | |
| | Examiner Joseph V. Micali | Art Unit 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/7/08</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. The amendments/arguments filed January 15th, 2009 have been entered. Claims 1-10 remain pending in the application. The previous objection to the specification with regards to the abstract has since been withdrawn in light of the applicant's amended abstract.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-3 and 5-10 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,874,739 by Boxhoorn, in view of US Patent No. 6,417,136 by Cheung et al.

With respect to claim 1, Boxhoorn teaches a process for the preparation of a silver-containing catalyst suitable for the oxidation of ethylene to ethylene oxide. Specifically, Boxhoorn teaches a step of impregnating a preformed alpha-alumina carrier (**claim 1**), which has been subjected to calcining and, optionally, other preforming treatments, as part of the preforming process (**claim 1 and column 2, lines 44-66**), with at least one alkali metal

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hydroxide modifier (**claim 3 with respect to claim 1, step c**). Boxhoorn teaches an optional step of drying the impregnated carrier (**column 4, lines 16-20**). Boxhoorn also teaches a step of washing the final carrier (**column 5, lines 8-11 and lines 30-35**).

Boxhoorn does not explicitly teach calcining subsequent to impregnation with the alkali metal salt.

Cheung is drawn to a hydrocarbon hydrogenation catalyst and process of making. Specifically, Cheung teaches calcining a metal-incorporated alumina to produce a carrier (**claim 1**), wherein the metal is incorporated by impregnation (**claim 2**). Furthermore, Cheung teaches that the process can involve the following steps: impregnating the alumina carrier with palladium, drying, calcining, then impregnating with a catalyst component, drying, and calcining (**claim 65**). Finally, Cheung teaches the addition of both silver and an alkali metal compound impregnated by an alkali metal hydroxide (**column 6, lines 30-65**).

At the time of invention it would have been obvious to a person of ordinary skill in the art to perform the process of Boxhoorn including the addition of a subsequent calcining step after impregnation with the alkali metal salt, in view of the teaching of Cheung. The suggestion or motivation for doing so would have been to produce a carrier and catalyst having preferred and suitable physical features of surface area, pore volume, average pore diameter, and crystalline domain size (**column 14, lines 45-49**).

With respect to claim 2, Boxhoorn teaches a step of depositing silver catalytic material on the calcined carrier (**claim 1**), as does Cheung (**see rejection supra**).

With respect to claim 3, Boxhoorn teaches a method wherein calcining is carried out a temperature of 800° C to 1800° C (**claims 11-12**). It would be obvious for both calcining steps to

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occur within the same temperature range, as calcining happens at a set range. Thus, the same temperatures would be used for each calcining step.

With respect to claim 5, Boxhoorn teaches a method wherein the alpha-alumina carrier is prepared by contacting boehmite alumina and/or gamma-alumina with an acidic mixture containing halide anions and water (**claim 2 and column 1, line 54 - column 2, line 2**).

With respect to claim 6 and 7, Boxhoorn teaches a method wherein at least one efficiency enhancing promoter is deposited on the preformed alpha-alumina carrier, with the promoter comprising a rhenium-containing compound (**claim 1 and column 3, lines 42-48**).

With respect to claim 8, Boxhoorn teaches a method wherein said alkene is ethylene (**claim 1**).

With respect to claim 9, Boxhoorn teaches a method wherein the alkali metal hydroxide is present in an amount from 0.01 to 5.0 weight percent, based on the total weight of the modified alumina carrier (**claim 15**).

With respect to claim 10, Cheung explicitly teaches the alkali metal hydroxide being sodium hydroxide (**column 7, line 17**).

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 4,874,739 by Boxhoorn in view of US Patent No. 6,417,136 by Cheung et al, as applied to claim 1 or 2 above, in view of US Patent No. 4,994,589 by Notermann.

Boxhoorn teaches a process for the preparation of a silver-containing catalyst suitable for the oxidation of ethylene to ethylene oxide. Boxhoorn teaches an extrusion of the alumina mixture in the form of shaped carrier particles (**claim 22**), specifically the shaped alpha-alumina particles comprise bars, rings, pellets, tablets and triangles (**column 3, lines 5-9**).

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Boxhoorn and Cheung, however, do not teach the shaped alpha-alumina carrier having a morphology comprising interlocking platelets.

Notermann teaches a process for epoxidation of an alkene including a supported silver catalyst. Specifically, the support consists essentially of alpha-alumina and the support particles have platelet-type morphology (**claim 1**). These platelets are shown to be interlocking (**Figure 1 as well as column 13, lines 8-14**). Both Boxhoorn and Notermann teach a silver-containing catalyst on an alpha-alumina carrier support and different types of morphologies the carrier could take.

At the time of invention it would have been obvious to a person having ordinary skill in the art to modify the product of Boxhoorn and Cheung by including an interlocking platelet morphology in view of the teaching of Notermann. The suggestion or motivation for doing so would have been to improve crush strength, pore volumes, and surface areas, thereby providing high performance characteristics of short term stability or high activity and long term stability (**Notermann, column 13, lines 17-22**).

Response to Arguments

6. Applicant's arguments, see action, filed on January 15th, 2009, with respect to the rejection(s) of claim(s) 1-10 under 102/103 with respect to the Boxhoorn and Notermann reference have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the Cheung reference.

The conclusion of applicant's arguments with respect to claim 1 is that, "Boxhoorn does not teach or suggest calcining after impregnation with the alkali metal salt" (pg 8 of arguments).

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With the newly amended rejection, the addition of the teaching of Cheung along with the motivation included provide an obviousness rejection over instant claim 1.

With respect to claim 2, the same initial argument is presented and has been addressed with the above paragraph and the aforementioned new rejection.

With respect to claim 3, the obviousness of both calcining steps having the same temperature range is shown above.

With respect to claim 5, the alkali metal fluoride salt would be in the mixture, thus, though not explicitly mentioning the acidity, it would necessarily follow that such a mixture would be acidic.

With respect to claims 6, 7, and 8, the same initial argument is presented and has been addressed with the second paragraph above and the aforementioned new rejection.

With respect to claim 9, there is indeed an overlap of ranges, and with such, **MPEP 2144.05 [R-5]** states that, “In the case where the claimed ranges ‘overlap or lie inside ranges disclosed by the prior art’ a prima facie case of obviousness exists.”

With respect to claim 4, the same initial argument is presented as to why the references are not combinable, and has been addressed with the second paragraph above and the aforementioned new rejection.

With respect to claim 10, the new reference Cheung explicitly teaches use of sodium hydroxide. See new rejection above.

Conclusion

7. Claims 1-10 are rejected.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph V. Micali whose telephone number is (571) 270-5906.

The examiner can normally be reached on Monday through Friday, 7:30am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry A. Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph V Micali/
Examiner, Art Unit 1793

/J.A. LORENZO/
Supervisory Patent Examiner, Art Unit
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